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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,555	05/08/2001	Jack Zhu	P52/SYCS-010	4035
959	7590	06/14/2005	EXAMINER	
LAHIVE & COCKFIELD, LLP. 28 STATE STREET BOSTON, MA 02109			PHAN, MAN U	
			ART UNIT	PAPER NUMBER
			2665	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/851,555

Applicant(s)

ZHU ET AL.

Examiner

Man Phan

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 14-19, 21-33, 35-41, 43-44 is/are rejected.
- 7) ☒ Claim(s) 13, 20, 27, 34 and 42 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Response to Amendment and Argument***

1. This communication is in response to applicant's 01/28/2005 Amendment in the application of Zhu et al. for a "Method for restoring diversely routed circuits" filed 05/08/2001. The proposed amendments to the claims and response have been entered and made of record. Claims 11 and 45-51 have been canceled per Applicant's request. Claims 1-10 and 12-44 are pending in the application.

2. The examiner has withdrawn the Objections of record based on Applicant's amendment.

3. Applicant's remarks and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C. 103 as discussed below. Applicant's argument with respect to the pending claims have been fully considered, but they are not persuasive for at least the following reasons.

4. Applicant's argument with respect to the rejected claim 1 that the cited references fails to disclose or suggest wherein "*the trigger mechanism is received at one of a destination node and a source node of a first path such that the trigger is indicative of a path failure*". However, as discussed in the previous Office Action, Manchester (US#5,793,745) is applied herein merely for the teaching of the switching of path using trigger mechanism which facilitate efficient protection switching in network communications. The Applicant's attention is directed to the Protection Bundling (PB) process as shown in Figs. 6-8 in which the node detects the failure

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(Fig. 6) and receives a PB trigger (Fig. 8). Fig. 7 is a flow chart 700 of the protection bundling switching process performed by a node that detects the failure, and Fig. 8 is a flow chart 800 of the protection bundling switching process performed by a node, which "detects" the failure indirectly by receiving a trigger from another node (Col. 7, lines 12 plus). Indeed, before the link failure occurs, the network is in a no fault state (step 802). After the failure occurs, the node is informed of the failure when it receives a trigger (step 804). For example, node F receives a trigger from node D (see step 718). When the trigger is received, the node determines whether or not it is associated with a protection bundle (step 806). If not, there are no signals to restore (step 808) and the process is ended (Col. 8, lines 1 plus). A trigger mechanism alerts downstream nodes for the need to initiate protection switching where the node detecting the failure is not the terminating node for one or more BPFs. That is, if BPFs pass through a node detecting a failure, a trigger mechanism is used to notify the end-points of the BPFs passing through the node. In FIG. 5C, for example, node D detects a failure on the CD link 550 and sends a trigger to nodes F and H, which are the end nodes for BPF CF and BPF CH, respectively (Col. 8, lines 63 plus). Furthermore, Agrawal et al. (US#6,763,190) discloses a method for automatically provisioning the network from a service path to a restoration path after a failure occurs in the service path (*restoring a diversely routed circuit in a mesh network*), comprising the steps of (a) receiving, at the node, an indication of the occurrence of the failure in the service path (*receiving triggers indicating a path failure*); (b) if the node is an intermediate node of the service path, then transmitting, by the node, a failure message to its next node along the service path; (c) if the node is the end node of the service path, then transmitting, by the node, a restore message to its previous node along the restoration path; and (d) if the node is an intermediate node of the

restoration path, then transmitting, by the node, a restore message to its previous node along the restoration path (*restoring to a functional path*) (Col. 2, lines 14 plus). Therefore, examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-10, 12, 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al. (US#6,763,190) in view of Manchester (US#5,793,745).

With respect to claims 1-6, Agrawal et al. (US#6,763,190) discloses a novel system and method for path restoration, fault detection and service restoration processing for the node, according to the essential features of the claims. Agrawal et al. (US#6,763,190) discloses in Fig. 1 a method for automatically provisioning the network from a service path to a restoration path after a failure occurs in the service path, comprising the steps of (a) receiving, at the node, an indication of the occurrence of the failure in the service path; (b) if the node is an

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intermediate node of the service path, then transmitting, by the node, a failure message to its next node along the service path; (c) if the node is the end node of the service path, then transmitting, by the node, a restore message to its previous node along the restoration path; and (d) if the node is an intermediate node of the restoration path, then transmitting, by the node, a restore message to its previous node along the restoration path (See also Fig. 4; Col. 2, lines 12 plus and Col. 10, lines 20 plus).

However, Agrawal et al. (US#6,763,190) does not expressly disclose the receiving one or more triggers at one of a destination node and a source node of a first path. In the same field of endeavor, Manchester (US#5,793,745) discloses a trigger mechanism (612) connected to an output of the working facilities and responsive to the fault detector (608) and table (610) and configured to send triggers to terminating nodes. A coordination mechanism 614 may be connected to an output of the protection facilities and responsive to the fault detector 608 and table 610 to initiate switching in a headend switch. The coordination mechanism 614 may also be responsive to a received coordination signal or a trigger signal and configured to activate the facility selector. A trigger mechanism alerts downstream nodes for the need to initiate protection switching where the node detecting the failure is not the terminating node for one or more BPFs. That is, if BPFs pass through a node detecting a failure, a trigger mechanism is used to notify the end-points of the BPFs passing through the node. In FIG. 5C, for example, node D detects a failure on the CD link 550 and sends a trigger to nodes F and H, which are the end nodes for BPF CF and BPF CH, respectively (Col. 6, lines 57 plus). Manchester further teaches in Fig. 8 a flow chart 800 illustrated the protection bundling switching process

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performed by a node which does not directly detect the failure. Rather, this node "detects" the failure indirectly by receiving a trigger from another node (Col. 8, lines 1 plus).

Regarding claims 7-10, 12 and 14, 15, Manchester (US#5,793,745) further teaches the protection switching in the network as illustrated in Fig. 4C, in which in addition to terminating protected VPs, node D is a through node for protected VPs between nodes C and F and between nodes C and H. Node D, having detected a failure on the node C-D link 406, sends 4096 trigger cells 412 to node F and 4096 trigger cells to node H at the time it is sending the 4096 coordination cells to node C. Upon receipt of trigger cells 412, nodes F and H act in the same manner as node D with respect to node C in order to receive VPs from node C on the protection facilities. That is, nodes F and H each send 4096 coordination cells 414 to node C and each receives 4096 acknowledgment cells 416 from node C over the protection facilities. This reestablishes the VPs between node C and node F and node C and node H through the path including node G (Col. 3, lines 42 plus). Manchester further teaches in Fig. 5A,B illustrated a SONET/SDH network having protection bundling, in which assume a link failure occurs on link CD. Using the PB method, a link failure between nodes C and D would be detected at node D. Node D immediately sends one coordination cell along CPR CD representing all of the VPs within the PB which traverse BPF CD. Node D also sends one trigger cell to node F for BPF CF because BPF CF passes through node D. Upon receipt of the coordination cell from node D, node C sends one coordination acknowledgment cell back to node D along CPR CD and switches its working VPs associated with BPF CD to CPR CD. Node D receives the coordination acknowledgment cell from node C and begins receiving VPs from CPR CD. The working PB is now restored. When node F receives the trigger cells from node D, these nodes

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initiate the PB protection switching and restore the PB associated with BPF CF using the same method used for the PB terminating on node D (Col. 5, lines 39 plus and Col. 10, lines 5 plus).

One skilled in the art would have recognized the need for effectively and efficiently routing and path restoration in communication network, and would have applied Manchester's novel use of the trigger mechanism to detect and carry path failure conditions into Agrawal's teaching of the provisioning for the automatic restoration of communications. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Manchester's bundled protection switching in a wide area network background of the invention into Agrawal's network auto-provisioning and distributed restoration with the motivation being to provide a method and apparatus for restoring a diversely routed circuit in a mesh network.

4. Claims 16-19, 21-26, 28-33, 35-41, 43, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al. (US#6,763,190) in view of Manchester (US#5,793,745) as applied to the claims above, and further in view of Fukushima et al. (US#6,205,562).

With respect to claims 16-19, 21-26, 28-33, 35-41, 43, 44, Agrawal et al. (US#6,763,190) and Manchester (US#5,793,745) disclose the claims as discussed in paragraph 3 above. However, these claims differ from the claims above in that the claims require the path indicating a uni-directional/bi-directional failure. In the same field of endeavor, Fukushima et al. (US#6,205,562) discloses a method of path restoration in a compound ring network typically comprising two networks such as a UPSR (*Uni-directional Protection Switch Ring*) and a BLSR (*Bi-directional Line Switch Ring*) connected to each other. In particular, a path

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switching method and a path switching apparatus having a function for switching from a working path to a protection path starting from two adjacent input nodes (and ending at a common path terminating node) as a normal line (an active path) by using a path switch in such a compound ring network (Figs. 1-4; Col. 3, lines 56 plus).

One skilled in the art would have recognized the need for effectively and efficiently routing and path restoration in communication network, and would have applied Fukushima's method of path restoration in switched ring node using uni-directional/bi-directional data transfer, and Manchester's novel use of the trigger mechanism to detect and carry path failure conditions into Agrawal's teaching of the provisioning for the automatic restoration of communications. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Fukushima's path switching method, path switching apparatus and nodes of UPSR, and Manchester's bundled protection switching in a wide area network background of the invention into Agrawal's network auto-provisioning and distributed restoration with the motivation being to provide a method and apparatus for restoring a diversely routed circuit in a mesh network.

***Allowable Subject Matter***

5. Claims 13, 20, 27, 34 and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein the algorithm calculates that a switch is required and that the switch has not already occurred, switching one of the source and destination nodes from the first path to a functional second path, as specifically recited in the claims.

### ***Conclusion***

9. **THIS ACTION THIS ACTION IS MADE FINAL.** See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149. The examiner can normally be reached on Mon - Fri from 6:00 to 3:00.

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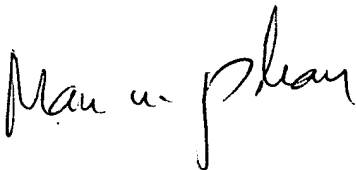
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at toll free 1-866-217-9197.

Mphan

June 09, 2005



**MAN U. PHAN**  
**PRIMARY EXAMINER**